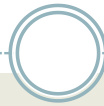


ERTAC Tool Logic and Flowcharts



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PRESENTATION OVERVIEW



- **Preprocessor Functions**
 - Data QA
 - Data manipulations
 - Calculations
- **Projection Processor Functions**
 - Generation calculations
 - Generation deficit units defined, if needed
 - Excess power redistribution-Two step process
 - Emission calculations
 - Outputs
- **Post Processors**
- **Questions?**



Preprocessor Functions

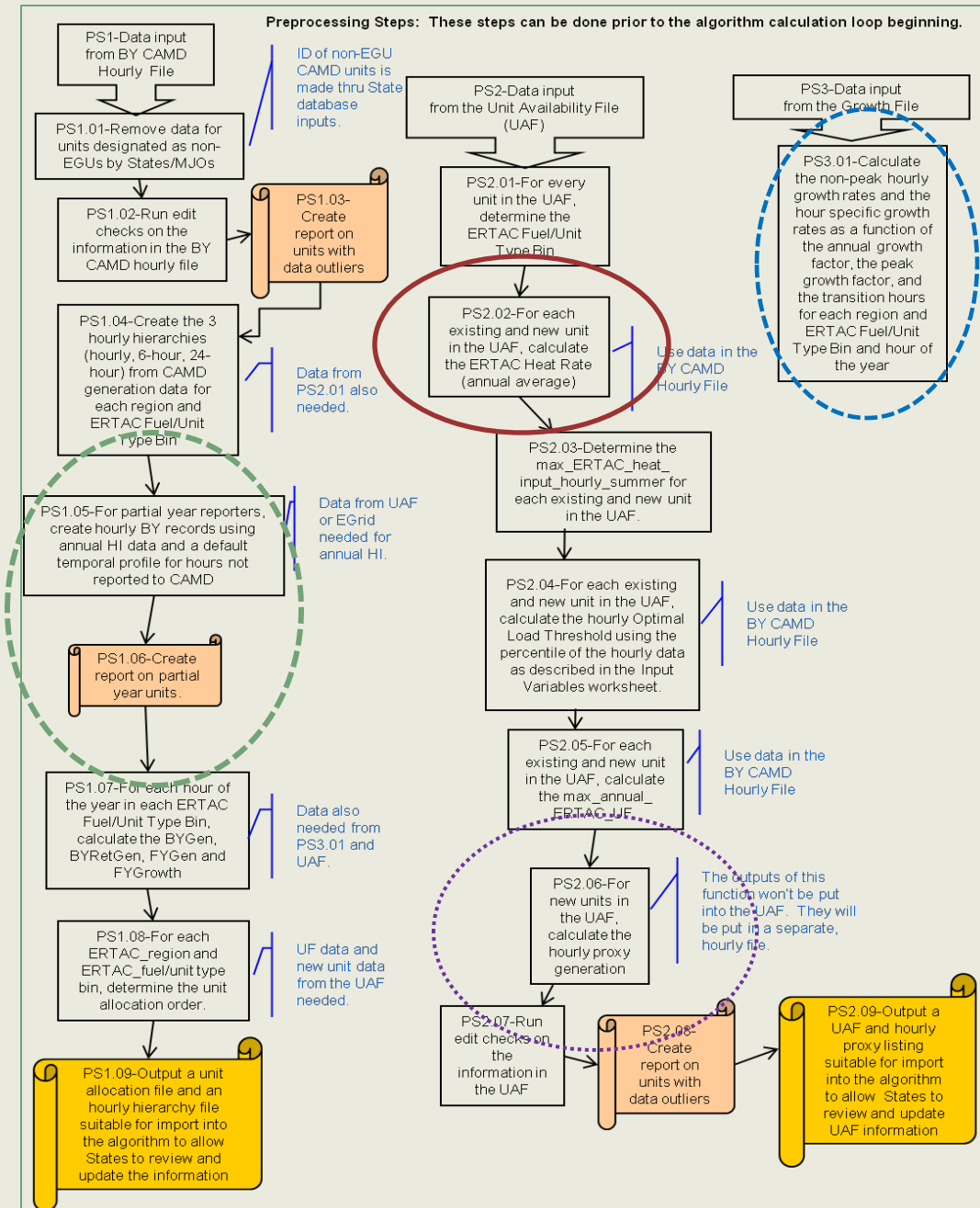


- Need for preprocessing
- Preprocessing allows improved projection outputs
- Basic functions:
 - Hourly CAMD data update to remove non-EGUs
 - Examine data outliers
 - Sets up base year (BY) structure
 - Examines input files



Preprocessor

- Creates a **preprocessor log file**
 - Important for QA
 - Improves input files
- Files from the preprocessor are fed to the processor



Projection Processor, Part 1



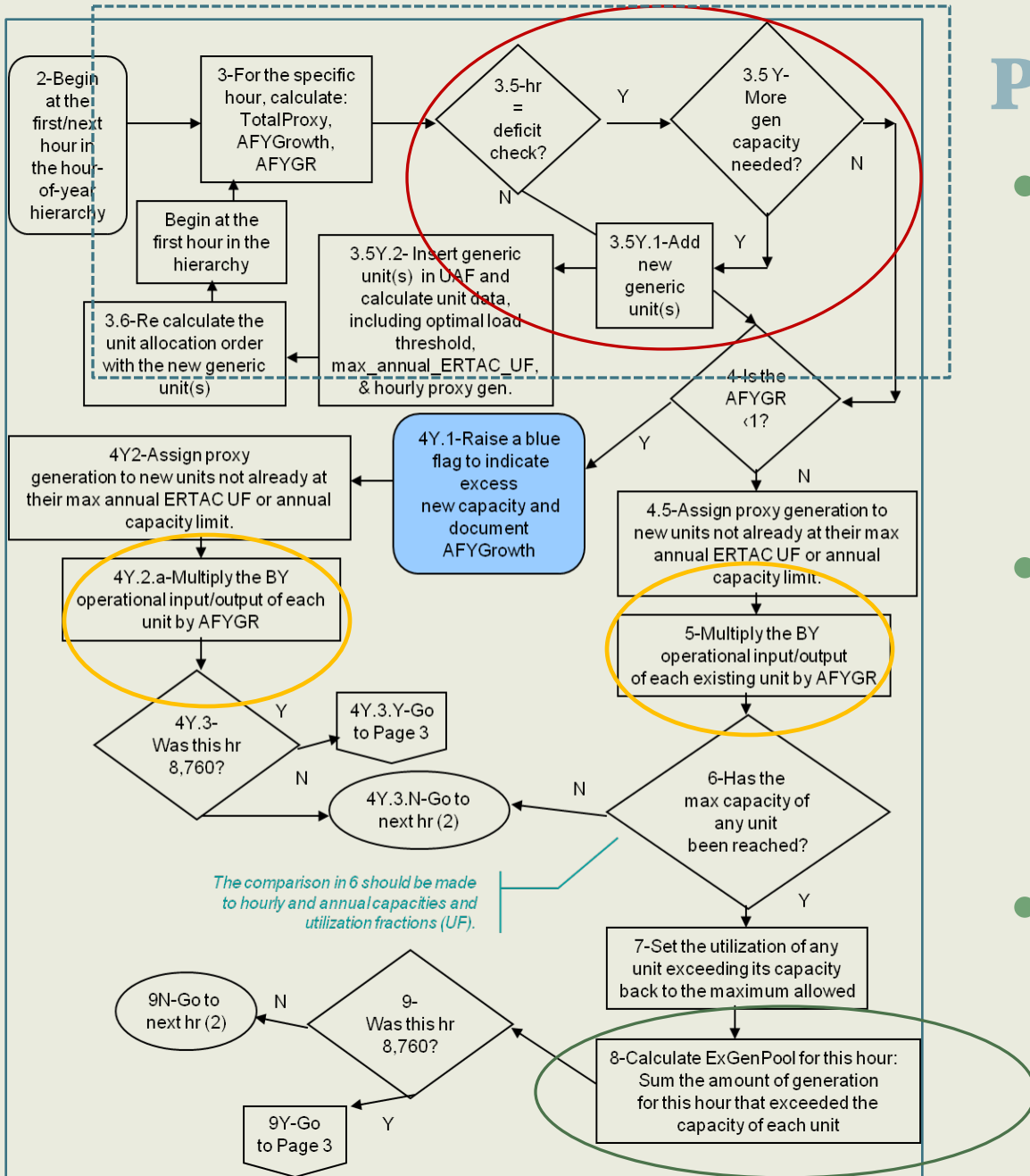
- **Calculates future generation**
 - By region and fuel/unit type
 - Outputs are modular
- **Capacity deficit check**
 - May generate generation deficit units
 - Treated as new units, with profiles
- **Grows all existing units based on hourly growth rates**
- **Determines if there is excess generation in any hour**

Projection Processor, Part 1

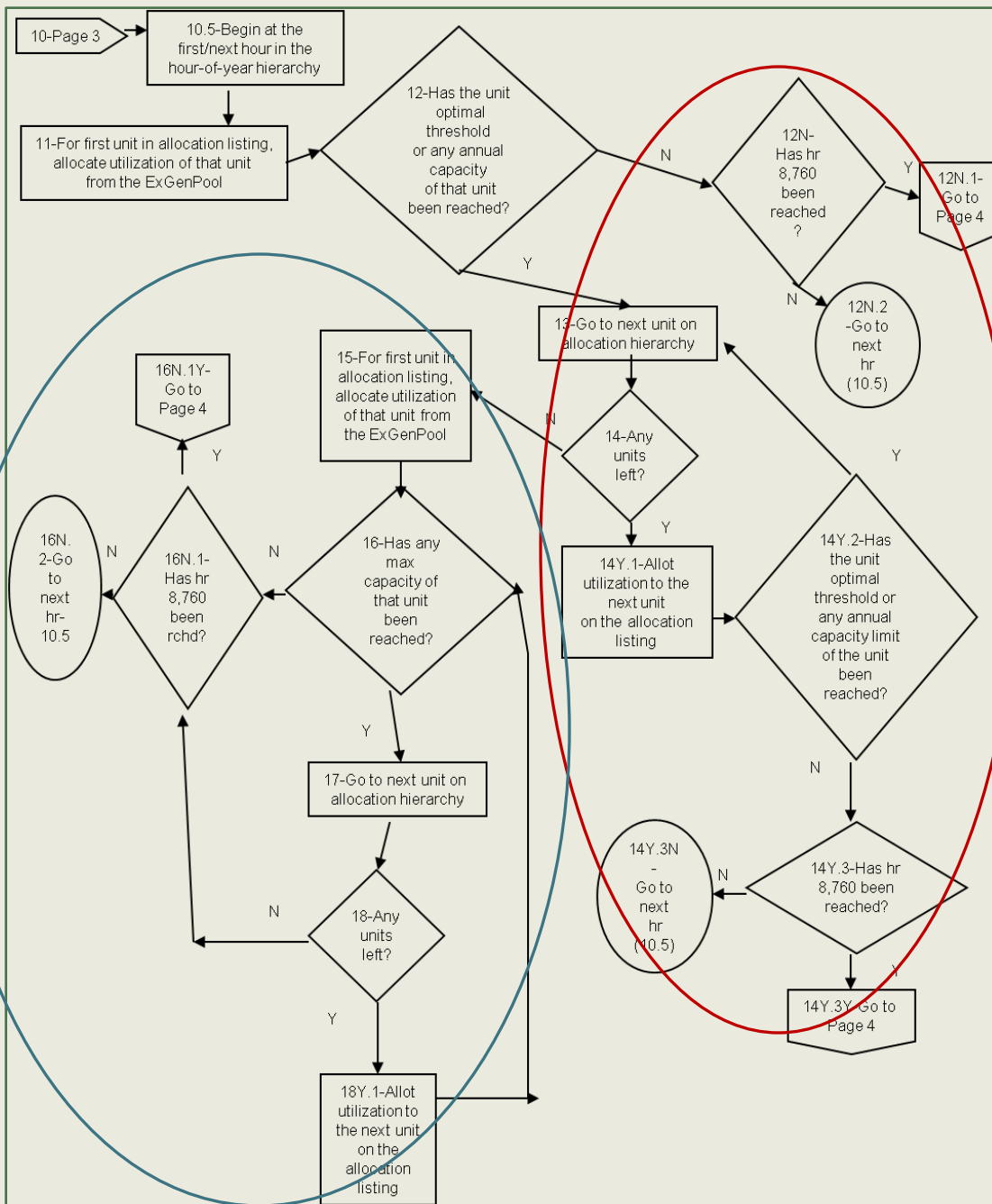
- Capacity check
 - GDUs
 - May require recalculation

- Grow existing units for each hour of the year

- Creation of Excess Generation Pool (ExGen)



Projection Processor, Part 2



- Distributes ExGen

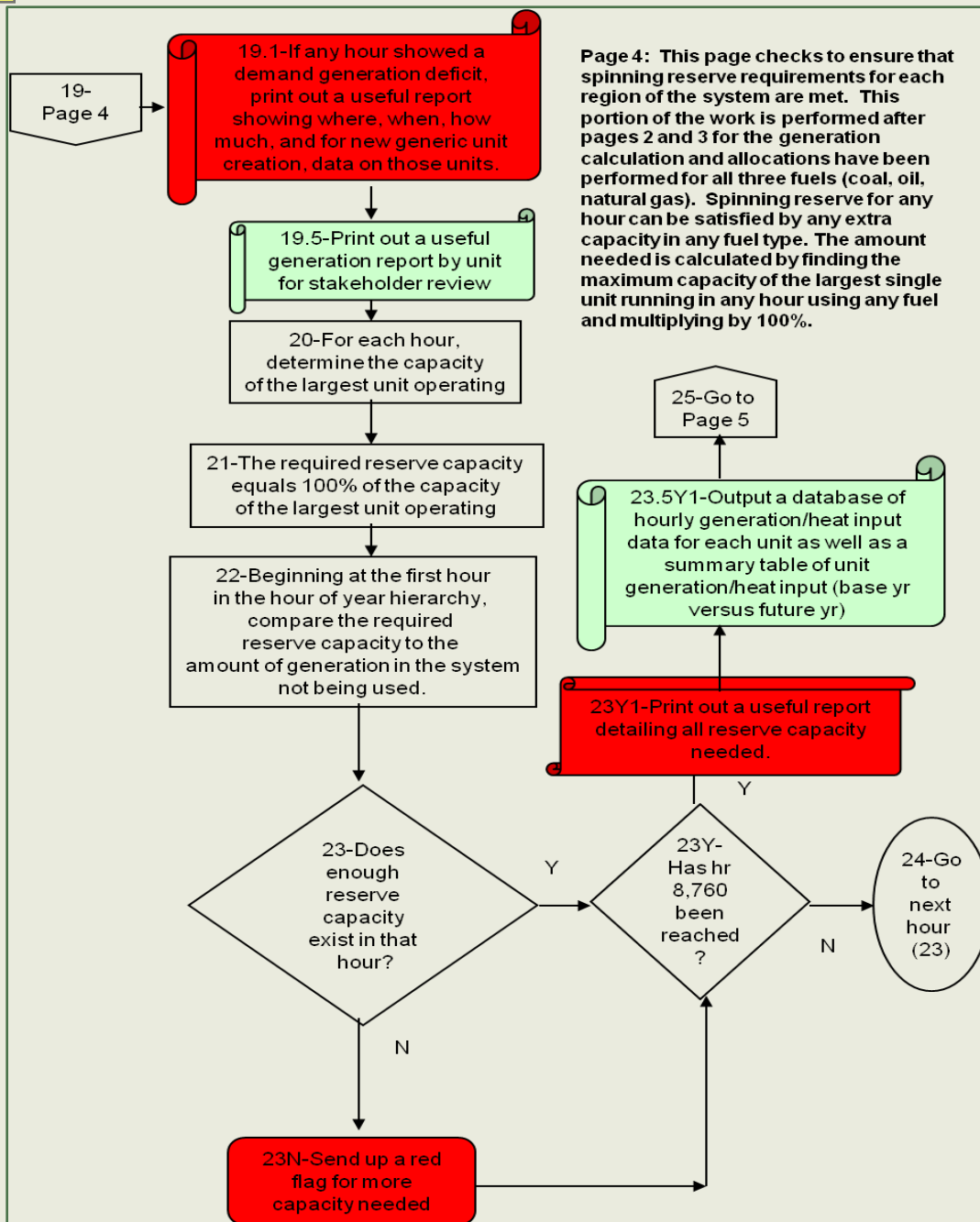
- Two step distribution

- Optimal threshold
- Maximum threshold

- Activity for a unit depends on

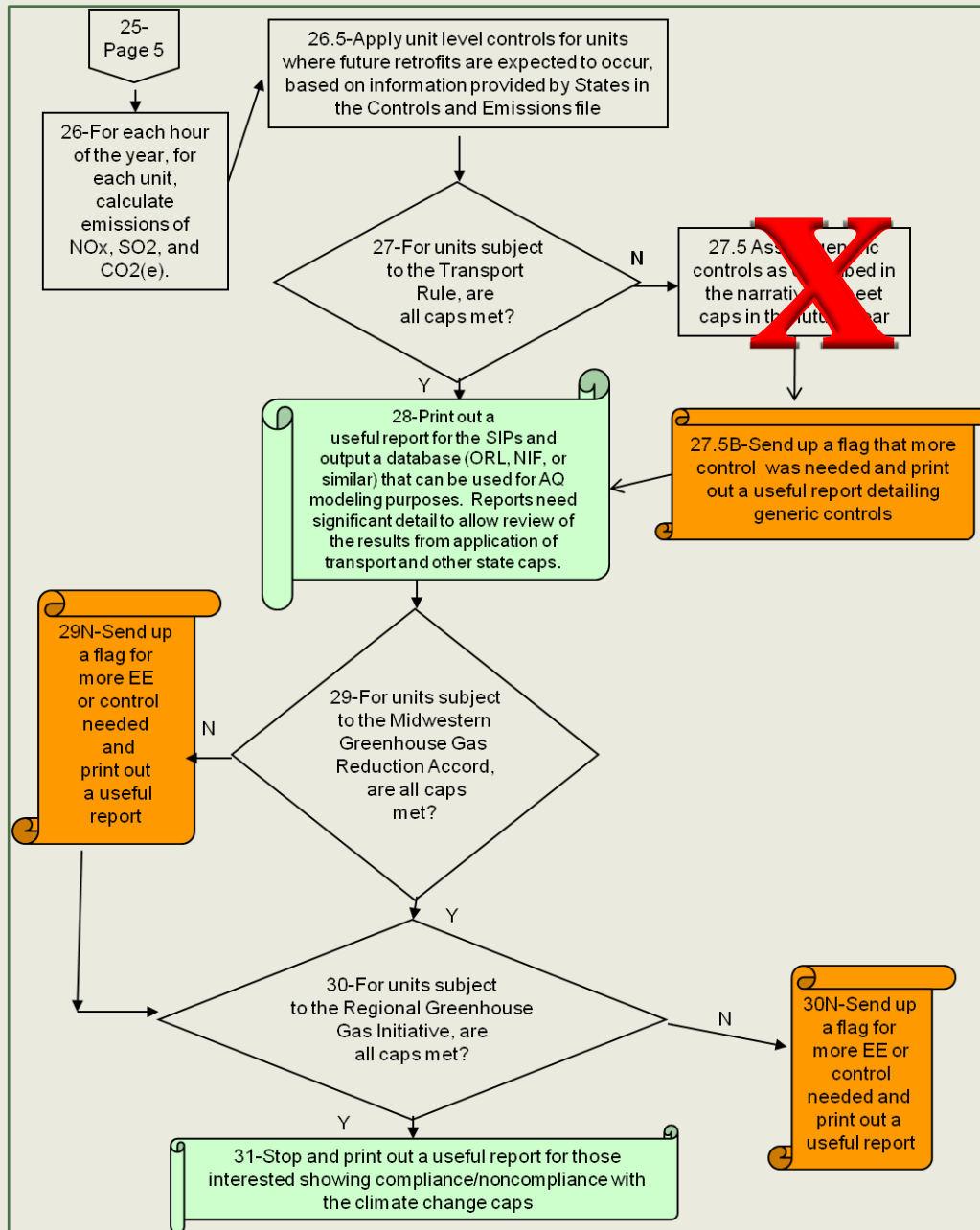
- Growth rates,
- New units,
- Retired units,
- Capacity constraints on other existing units

Projection Processor, Part 3



- Spinning reserve check
- Additional capacity available up to 100% of largest unit on line
- Sends up a red flag if reserve requirements are not met

Projection Processor, Part 4



- Calculates emissions
- Compares state and regional emissions against supplied caps
- Sends up a red flag caps are not met
- Does **not** currently assign tool-generated controls to ensure caps are met

Projection Processor Notes



- Future year (FY) activity is firmly grounded in BY meteorology
- Many FY estimates may be adjusted by region and fuel unit type bin in the input_variables
- NonCAMD units may be included IF:
 - Hourly BY activity data in a CAMD-like format exists
 - AEO/NERC growth rates are applicable to the unit
- Creates a **processor log file**
- Output files are quite large (hourly data):
 - 3,000-4,000 units, most with 8,760 hours of data;
 - Input and output files each several gigabytes (about 16 GB total)

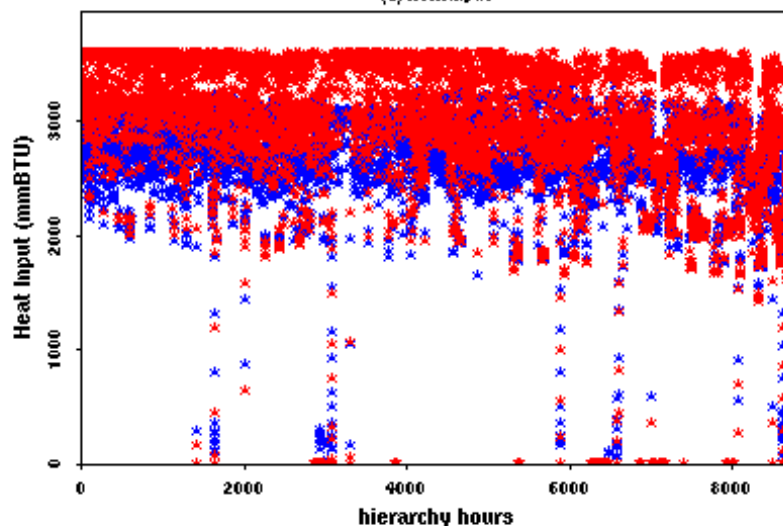
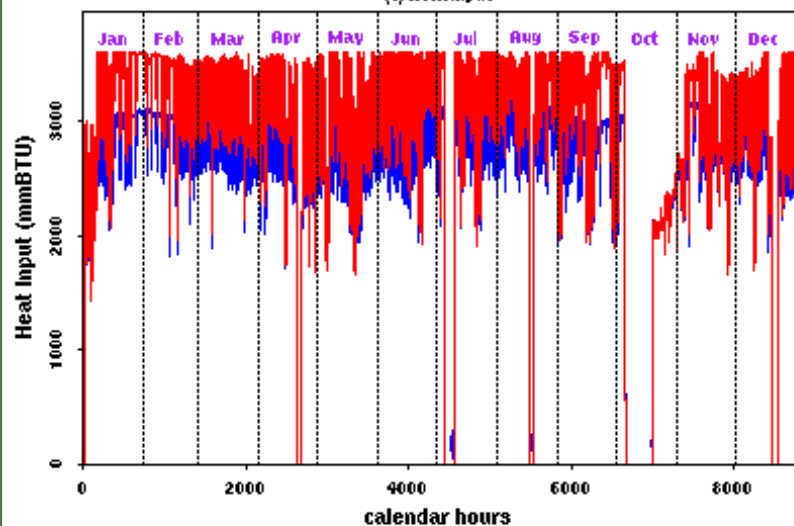
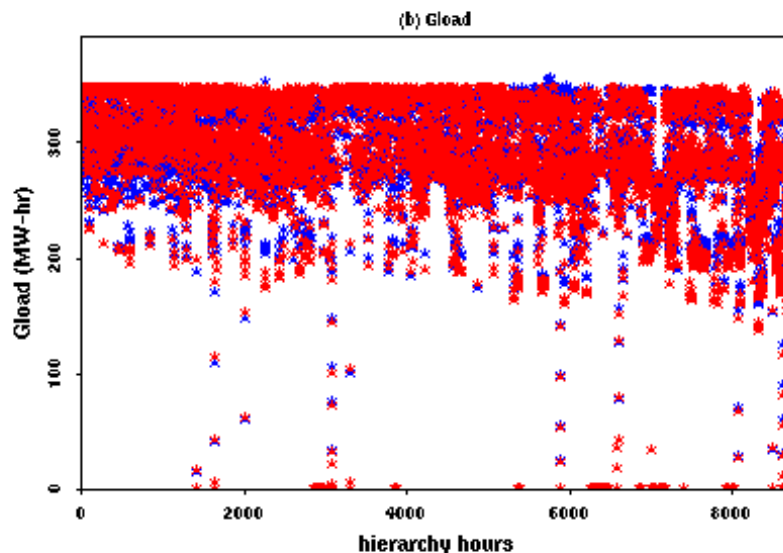
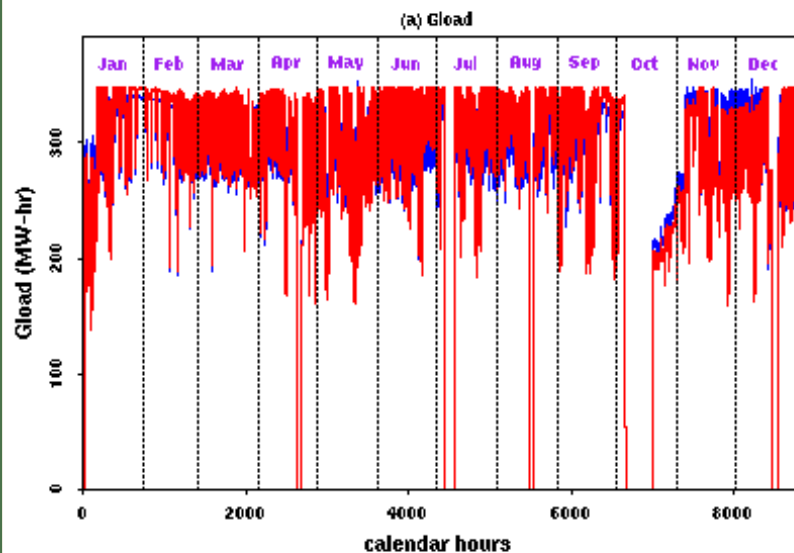
Post Processors



- Several have been developed
- Aids in data review and trouble shooting
- Output files are large, but can be manipulated in very interesting ways

Graphical Post Processor

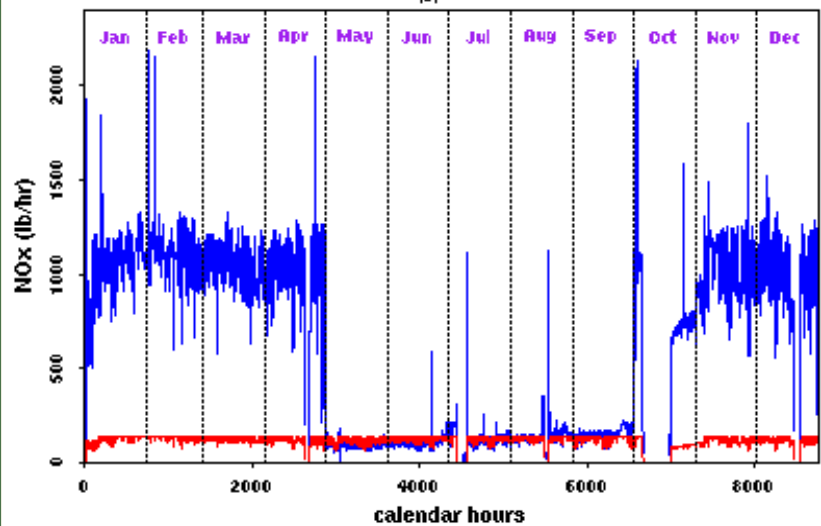
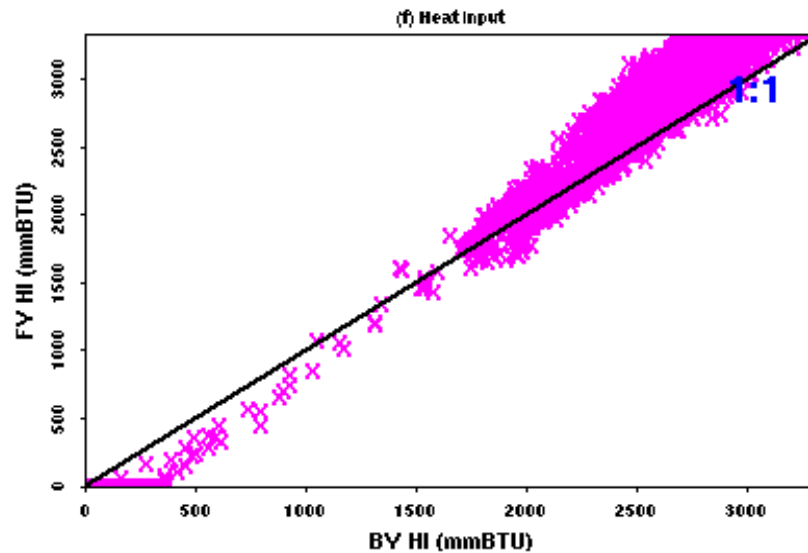
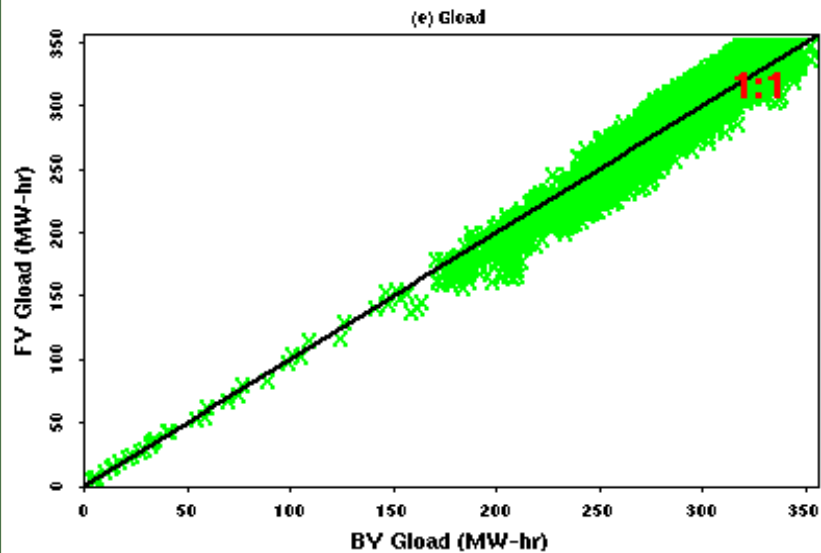
unit level activities at 3797-5 (page 1)



(a), (c) — 2007 CAMD — ERTAC Projection (b), (d) * 2007 CAMD * ERTAC Projection

Graphical Post Processor

unit level activities at 3797-5 (page 2)



(e) X Gross Load (MW-hr)

(f) X Heat Input (mmBTU)

(g) — 2007 CAMD

— ERTAC Projection

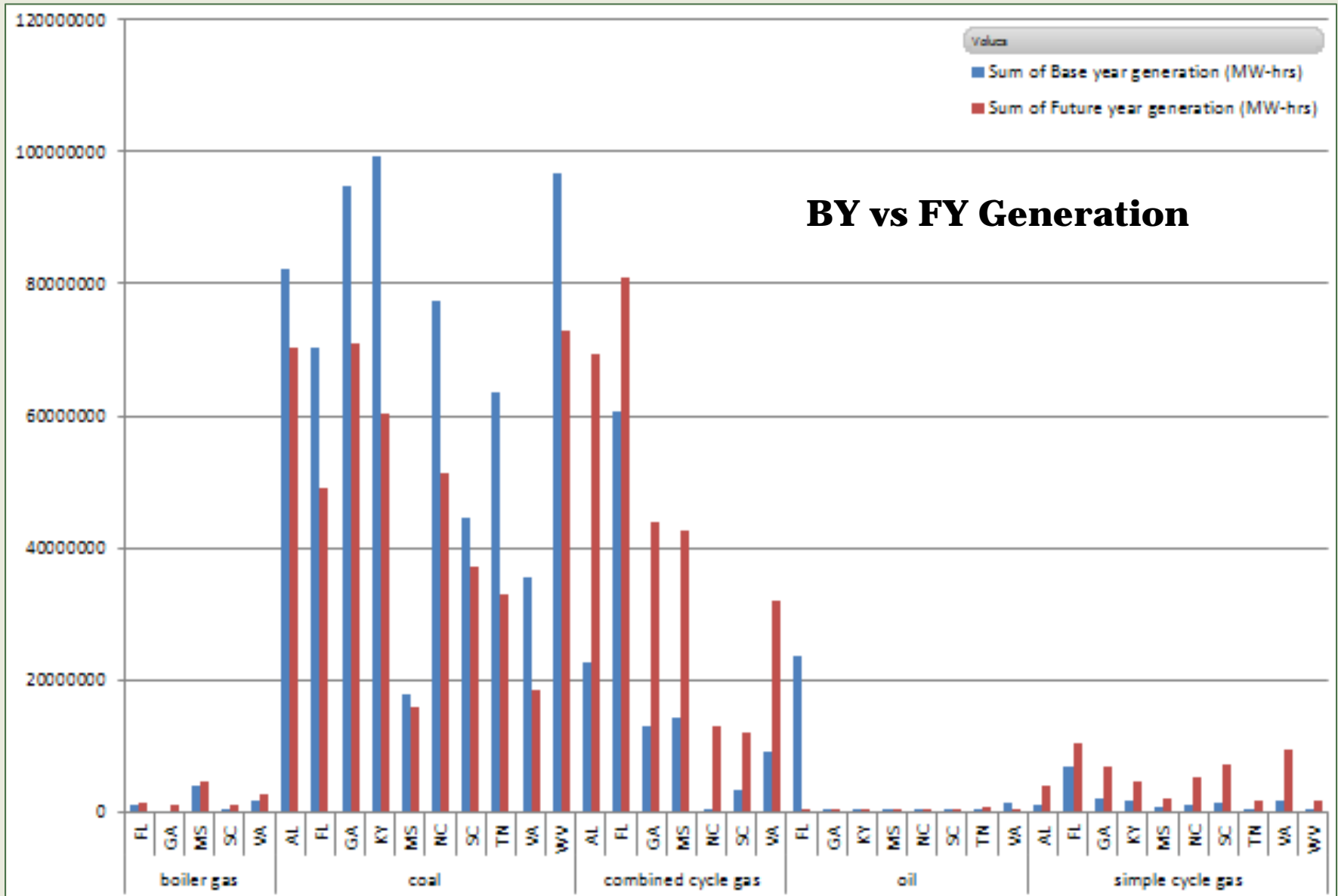


Enhanced Unit Activity File

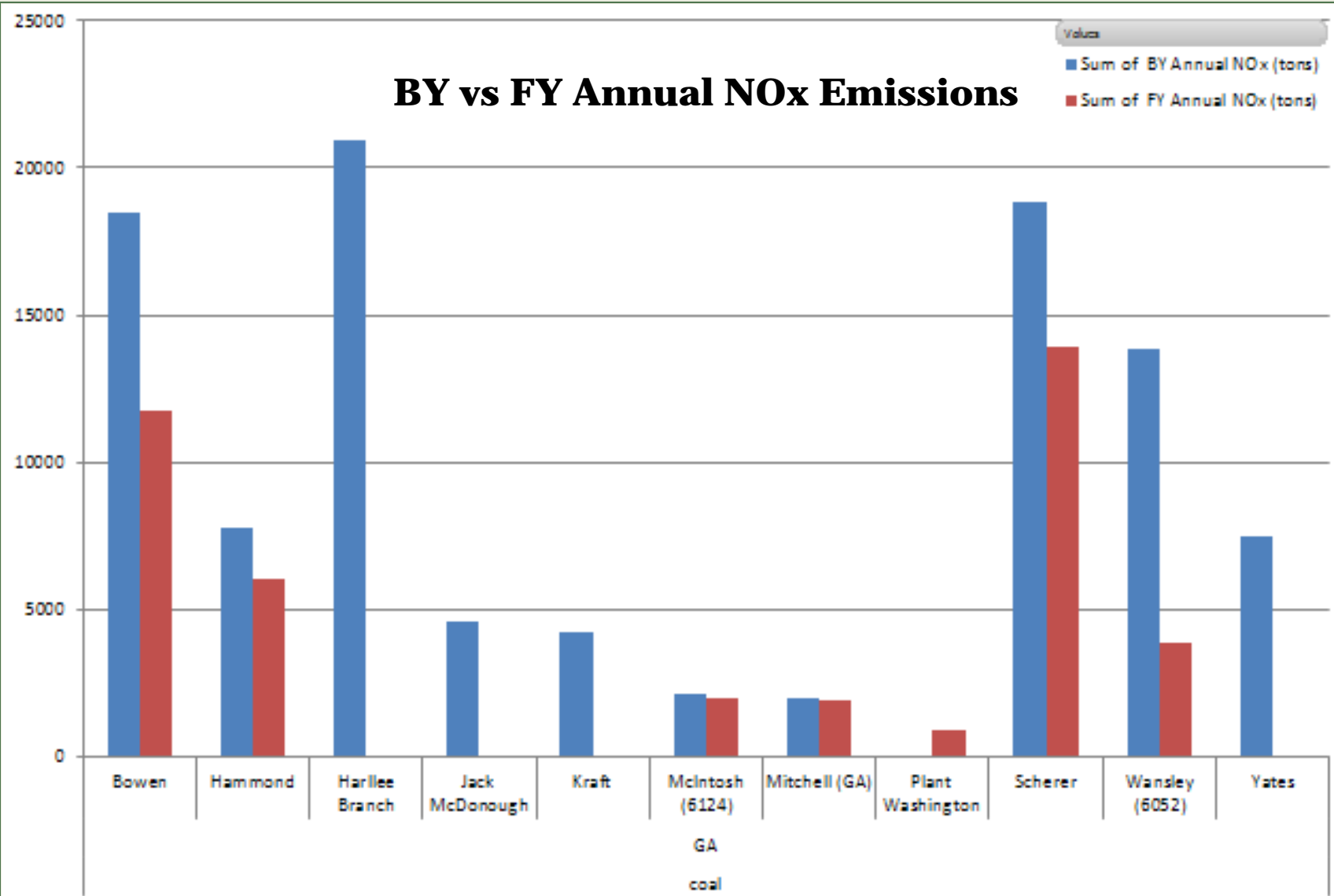


- **ORIS/Unit ID**
- **Facility Name, State, Region**
- **Fuel/Unit Type**
- **Activity Data**
 - Annually and OS
- **Emissions Data**
 - NO_x, SO₂
 - Annually and OS
- **Other data**
 - Lat/longs
 - Retirement dates
- **May be used for QA**
- **Can be manipulated into charts and spreadsheets**
- **Compared with inventory estimates**

Pivot Table Options

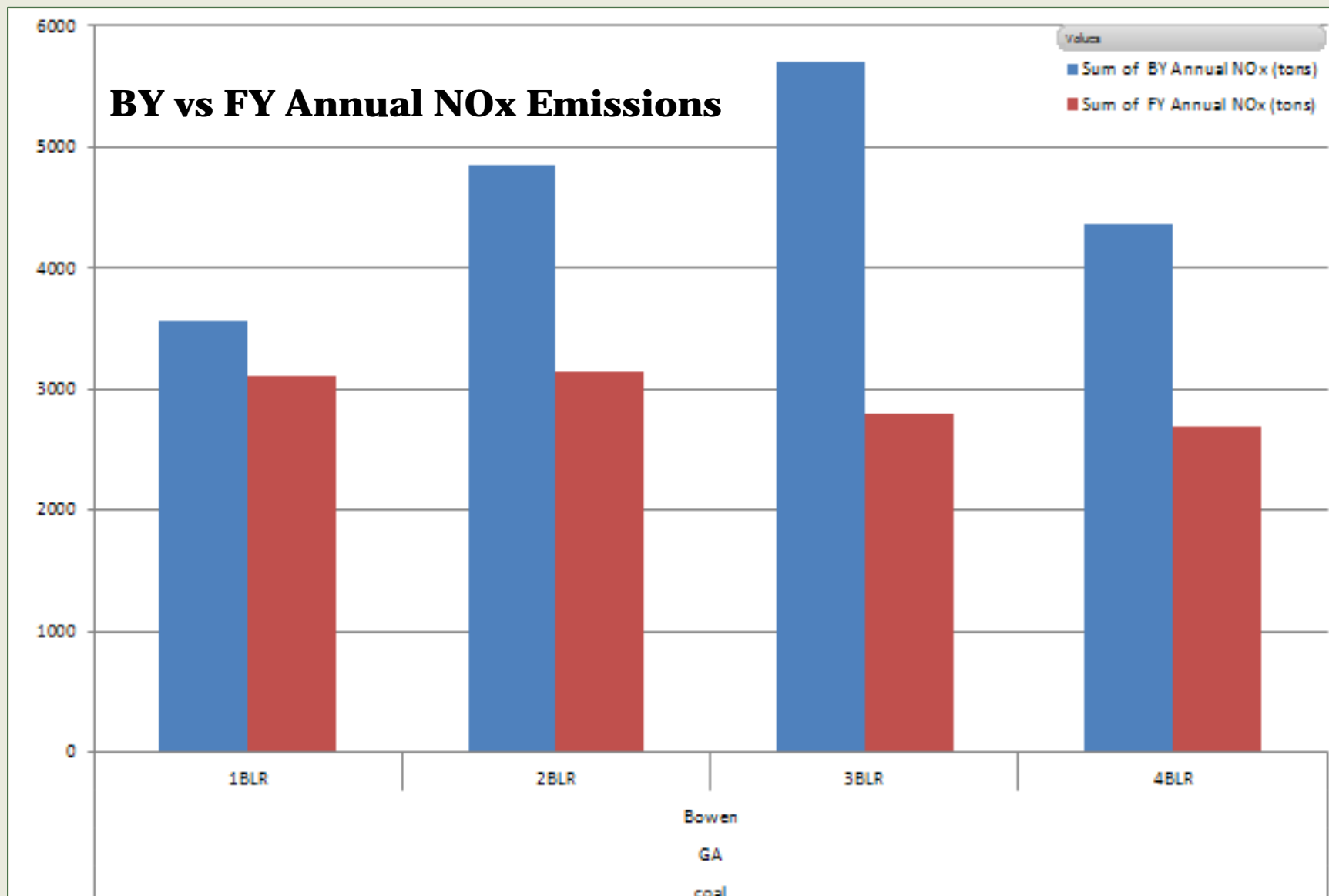


Pivot Table Options, Facility Level





Pivot Table Options, Unit Level



Questions? Comments? Thoughts?



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